6. REMEDIAL ACTION WORK PLAN

6.1 Relevant Changes to the RD/RA SOW

The OU 3-13 RD/RA SOW (DOE-ID 2000) identifies that the scope for Group 4 consists of the installation of 10 new vadose zone wells and the monitoring of an unspecified number of existing wells. In addition, reference is made that six "cluster" wells may be installed around the INTEC tank farm. Each set of "cluster" wells consisted of four different completion depths. The total number of wells under consideration was 34, that include the 10 wells to better understand moisture movement and an optional 24 wells around the tank farm. Through an evaluation of the available data and the DQO process a decision was made that a total of 21 wells, fifteen in Phase I and an additional six wells in Phase II would be installed to meet the objectives of the OU 3-13 ROD. The work scope includes the long-term monitoring of the new and existing wells in order to evaluate the drain-out of the perched water zones beneath INTEC.

If the planned removal of the percolation ponds does not result in adequate drain-out of the perched water zones, additional recharge control measures will be evaluated and implemented. Recharge controls under consideration at this time include (1) lining the BLR, (2) upgrading the INTEC-wide drainage controls, repairing leaking fire water lines, and eliminating steam condensate discharges, and (3) closing and relocating the existing Sewage Treatment Plant lagoons and infiltration galleries.

Phase I has been established in order to accommodate the current plan for 15 wells and the Tracer Study activities. Additionally, the planning for Phase II, to begin in mid-FY02, has been developed to reflect to the six wells currently in the Phase II scope.

MSIP Activities	OU 3-13 RD/RA SOW	Change
Total of 21 monitoring wells installed in 2 phases	Total of 10 monitoring wells	An increase of 11 monitoring wells
Tracer Study	No Study	A Tracer Study added

6.2 Subcontracting Plan

The work elements comprising this remedial action consist primarily of well drilling, the installation, tracer study, and sampling and analysis of the wells.

The drilling and well installation are planned to be competitively bid for and awarded to the lowest qualified bidder on the basis of cost (per lineal foot of drilling). BBWI's procurement process will be followed and will include, but is not limited to, issuance of a Request for Proposal, prebid conference, bid evaluation, notice of award, notice to proceed, vendor data submittals, and preconstruction kick-off meeting.

Other work elements described in this MSIP may be performed under a single subcontract or several subcontracts. Site force personnel may perform a portion of this work, if necessary. Both subcontract and site personnel will be required to perform to the schedule detailed in Appendix L of this document in order to meet the overall project schedule and objectives.

Task elements expected to be subcontracted include:

- Tracer Study

- Well Drilling/Completion
- Laboratory Analysis.

6.3 Remedial Action Work Elements

This section provides an overview of the general method by which the eight major elements of the remedial action work plan will be accomplished. Because there is almost a year separating the end of Phase I well-drilling operations and the start of Phase II well-drilling operations, each phase will be a separate contract (possible with different subcontractors). For this reason, there will be duplication of premobilization, mobilization, and demobilization phases associated with drilling activities discussed below.

6.3.1 Premobilization

Premobilization efforts involve all work elements that must be completed before the drilling contractor arrives on the site to start work. This includes such work as securing a contract for drilling services, surveying proposed locations, marking proposed locations for underground utilities, approval of a work control package, and approval of vendor data submittals. The final premobilization effort is a formal prejob meeting at which the scope of work (FSP) is discussed and Health and Safety Plan (HASP) training is conducted. Any outstanding questions about the work to be performed are resolved at this meeting.

6.3.2 Mobilization

After the prejob meeting, the drilling contractor will be free to begin mobilization of their equipment to the site. Mobilization of equipment consists of physically locating all drilling and ancillary equipment at the site and setting up on the first hole to be drilled. This will include an inspection and acceptance of the drilling equipment mobilized to the site by the Field Team Leader, or designee.

6.3.3 Phase I well Installation

Installation of the Phase I wells will be under a competitively bid and awarded subcontract. Drilling of the new wells will be performed in accordance with the contract established with the drilling subcontractor during premobilization actions. A trained geologist supported by the area construction engineer will observe the well drilling activities to log the borehole and well construction and ensure that the final completion meets the contract requirements. INEEL personnel will perform sample collection activities associated with the drilling. Borehole geophysical logging will be performed by the USGS.

6.3.4 Baseline Sampling

The nine Phase I wells, along with approximately 40 existing INTEC vadose zone and aquifer wells, will be sampled by INEEL personnel before the tracer study is conducted. A subcontract laboratory will perform analysis of the samples. Coordination of the laboratory contracting and data management will be performed by the INEEL sample management organization.

6.3.5 Tracer Study

The tracer study will be a coordinated effort between INEEL personnel and the tracer study subcontractor, OUL. Primarily INEEL personnel will perform field activities for the tracer study (pre-injection sampling, tracer introduction, tracer test sampling, and sample analysis). OUL personnel will be

on site to support the introduction of the tracer. Dye analysis work will use a Shimadzu RF5301 Spectrofluorophotometer based at INTEC to ensure the samples, expected to be contaminated, do not leave the facility. The raw data will be submitted to the OUL on disk for processing and analysis.

6.3.6 Phase II Well Installation

Phase II well installation will be performed in a manner similar to Phase I, as discussed above.

6.3.7 Long-Term/Monitoring of Phase I & II Wells

The 21 Phase I & II wells and 40 existing INTEC vadose zone and aquifer wells will be sampled and monitored on an annual basis for five years following the relocation of the percolation ponds. Sampling activities will be performed in a manner similar to baseline sampling discussed above.

6.3.8 Demobilization

Once drilling has been completed and instrumentation has been placed in the wells, the subcontractor will begin demobilization of their equipment. Demobilization includes the physical removal of all equipment from the site, restoration of disturbed areas, and general cleanup of all work areas. Once demobilization is complete, the work areas should be as close to original condition as possible. Phase I well drilling will precede Phase II drilling by approximately one year. The two phases will be treated as separate and distinct contracts with separate demobilization operations required.

6.3.9 Contingent Remedy Phase

Recharge Control—The need for recharge control measures and/or additional monitoring wells will be assessed only after the results of Phase I and Phase II activities are finished, the percolation ponds have been relocated, and the five year monitoring of the perched water zones have been completed.

6.4 Evaluation of Remedial Action Against Performance Measurement Points

6.4.1 Evaluation of Tracer Study and Phase I Results

Phase I activities are primarily designed to refine the final design of the monitoring network used in Phase II to evaluate the remedial action effectiveness. As such, there are no specific remedial action performance measurement points associated with the Phase I activities.

However, the baseline sampling and tracer study which are components of Phase I actions will also be utilized to support the analysis of the Phase II monitoring results. Both the baseline sampling results and the tracer study will be incorporated into the conceptual model for contaminant transport in the subsurface at INTEC. This information will support understanding of the contaminant distribution in the INTEC subsurface and for the migration of recharge water and interconnections of perched water bodies. This information will be utilized in the numerical modeling tasks performed to evaluate the Phase II moisture content and COC concentration trends.

6.4.2 Evaluation of Phase II Results

The primary performance measurement point for the Group 4 remedial action, as discussed in Section 2 above, is meeting drinking water standards in the SRPA outside the INTEC security fence in the year 2095. Furthermore, the selected remedy for Group 4 states that "If after five years (following

relocation of the INTEC percolation ponds), the perched water zones are not draining out as predicted by the RI/FS model then additional recharge controls will be implemented." Because the performance measurement point does not occur until 2095, the actual evaluation of the Phase II results will essentially be a numerical modeling task performed to generate risk predictions based upon the observed trends in moisture content and COC concentrations during the five year monitoring period leading to the contingent remedial action decision.

The data obtained under this monitoring program will be evaluated and incorporated into an updated WAG 3 numerical model to determine if the moisture contents and COC fluxes have been reduced sufficiently to meet the COC concentration limits at the INTEC security fence line in 2095. As discussed above, this numerical modeling tasks will incorporate the results of the baseline sampling and tracer tests performed during Phase I, as well as the geochemical testing, moisture monitoring, and COC concentration data from both the perched water and Group 5 SRPA sampling. All new information collected during the Phase 1 or Phase II activities will also be incorporated into the numerical modeling and long-term risk predictions. Investigation of newly identified contamination in the vadose zone may be required to support the modeling and compliance with the RAOs.

A summary of the process to develop the numerical simulation of the Phase II monitoring data follows:

1. Refine the existing conceptual model describing the physical and chemical processes that will be represented in the simulation model.

2. Refine the existing parameterization of the model that meets the conceptual model assumptions. The OU 3-13 RI/FS model parameterization will be the primary source for this initial parameterization.

3. Calibrate the model. The calibration will consist of two parts. The first part will be an evaluation of the model structure that will determine which attributes of the subsurface model have the largest effect on predicted peak concentrations in the aquifer. The second part will consist of adjusting parameter values to improve model agreement to the field data.

4. Summarize the sensitivity and uncertainty analysis and how the results will be used.

5. Summarize the predictive model results and COC concentration predictions at the performance measurement point in 2095.

6.5 Field Oversight and Construction Management

The DOE-ID remediation project manager will be responsible for notifying the EPA and IDEQ of major project activities (e.g., project start-up or closeout) and other project activities it deems appropriate. DOE-ID will serve as the single interface point for all routine contact between the EPA, IDEQ, and BBWI.

BBWI is responsible for field oversight and construction management services for this project and will provide field support for health and safety, quality assurance, and landlord services. A project organization chart and associated position descriptions are provided in the project HASP.

Visitors to the project who wish to observe remediation activities must meet badging and training requirements necessary to enter INEEL and INTEC facilities. Project-specific training requirements for visitors are described in the project HASP.

6.6 Project Cost Estimate

A summary of project costs is provided in Appendix M. The costs will be revised for each submittal of the work plan to reflect new information and/or comments, as appropriate.

6.7 Project Schedule

The remedial action working schedule for Group 4 is presented in Appendix L and includes all project tasks from preparation of this work plan through performance of the remedial action and submittal of the Monitoring Report Decision Summary Report. Administrative and document preparation and field activities are based on a 40-hour work week. This schedule assumes concurrent contractor and DOE-ID document reviews. There is no schedule contingency for delays due to slow or late document reviews, or for field activities impacted by adverse weather conditions.

6.8 Remedial Action Reporting

The following reports will be prepared and submitted in compliance with RD/RA work plan reporting requirements:

Monitoring Well and Tracer Summary Report: A secondary document for Group 4 that will provide the results from the initial well installation and tracer studies. This report will be used to recommend refinements to the placement of wells for Phase II and the sampling frequency for groundwater compliance monitoring.

Monitoring Report/Decision Summary Report: A primary document that uses data from Phases I and II activities to document the data, rationale, and justification for decisions concerning the need for a third phase of contingent remedial actions. An updated Operations and Maintenance Plan will be included as a part of this report. This report will function as the Remedial Action Report for Group 4 activities.

6.9 Health and Safety

The project HASP was prepared specifically for the tasks and conditions expected during implementation and execution of this project. It is provided in Appendix H of this document. The HASP, which may be updated as site and project conditions dictate, includes the following elements:

- Task site(s) responsibilities
- Personnel training requirements
- Occupational medical program and medical surveillance
- Safe work practices
- Site control and security
- Hazard evaluation
- Personal protective equipment

- Decontamination and radiation control
- Emergency response plan for the task(s).

6.10 Waste Management

The following waste streams are expected to be generated as a result of the Group 4, perched water remedial action activities:

- Personal protective equipment
- Purge water
- Decontamination wastes/water
- Noncontaminated project waste
- Drill Cuttings.

Ultimate disposition of these waste will depend on whether they are radionuclide-contaminated. A description of these waste streams and their appropriate disposition are provided in the project Waste Management Plan (see Appendix F).

6.11 Quality Assurance

Quality Assurance and quality control requirements for all phases of this project will be controlled by the Site-approved Quality Assurance Project Plan for environmental restoration projects. The approved Quality Assurance Project Plan (QAPjP) for all environmental restoration project at the INEEL is provided in Appendix C of this document.

The QA objectives for measurement will meet or surpass the minimum requirements for data quality indicators established in the Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Inactive Sites (INEEL 1997). The QAPjP provides minimum requirements for the following measurement quality indicators: precision, accuracy, representativeness, completeness, and comparability.

The detection limits as described in the QAPjP (INEEL 1997) meet or surpass the decision-based concentrations of the contaminants of concern with the exception of I-129. I-129 quantitation requirement (reporting threshold) is 1 pCi/L, which necessitates a minimum detection limit (MDL) of 0.1 pCi/L to identify I-129 presence with any level of confidence. The 0.1 pCi/L MDL can be met using mass spectrometry coupled with a specialized sample introduction systems to increase sensitivity (which also serves to lower detection limits). High Resolution Inductively Coupled Plasma - Mass Spectrometry can also meet the 0.1 pCi/L MDL. This capability is being developed in the Analytical Laboratory Department at INTEC, which would allow measurement of environmental samples directly without chemical separation.

6.12 Decontamination

Upon completion of well drilling activities, exposed surfaces of equipment used for well drilling and sampling will be decontaminated at designated decontamination areas in each work zone by brushing

and wiping until all visible traces of soil and soil-related staining have been removed. If all the soil/staining cannot be removed by simple brushing and wiping, decontamination solutions (e.g., water) will be used. Decontamination issues are extensively addressed and discussed in the Waste Management Plan (Appendix F) and the FSP (Appendix B) of this document.

6.13 Operations and Maintenance

The project Operations and Maintenance plan (Appendix E) identifies routine and/or periodic monitoring, sampling/analysis, inspection, and maintenance requirements to be implemented following the completion of Group 4 well drilling/completion, and tracer test activities. The plan also identifies the requirements for periodic reporting and identification of end-points for long-term. Maintenance activities are expected to continue until the end of FY 2014. The long-term plan may be revised as necessary to incorporate changes and additions identified during the implementation of the plan.

6.14 Spill Prevention/Response Program

Any inadvertent spill or release of potentially hazardous materials (i.e., equipment fluids) will be subject to the substantive requirements contained in the *INTEC INEL Emergency Plan/Resource Conservation and Recovery Act Contingency Plan Implementing Procedures* manual (PLN-114-2). For additional detail see Appendix G.

Handling of the material and/or substance shall be in accordance with the recommendations of the applicable material safety data sheets, which will be located at the project site(s). In the event of a spill, the emergency response plan outlined in the project HASP will be activated. All materials/substances at the work site shall be stored in accordance with applicable regulations in approved containers.

6.15 Other Procedures Relevant to Remedial Action Activities

Appendix K provides a complete listing of all applicable management control procedures that are relevant to remedial action activities at the INTEC. A complete copy of each will be provided under a separate transmittal, for informational purposes only.

7. REPORTING

The working schedule and milestone list that details the timeframes and goals for the submission of each deliverable are listed in Appendix L. This schedule is a working schedule, which indicates the best effort to perform the Group 4 activities prior to the enforceable milestones and target dates. Table 7-1 provides a summary of the RD/RA deliverables enforceable milestones for primary documents and target dates for secondary documents highlighted. These milestones and target dates are within the overall FFA/CO schedule for the INEEL and consistent with the OU 3-13 RD/RA SOW. Requests for extensions to the enforceable schedule will be submitted to the Agencies for concurrence and approval.

Section XXII-22.1 of the FFA/CO states that "consistent with Section 121(c) of CERCLA, 42 U.S.C. 9621(c), and in accordance with this Agreement, U.S. DOE agrees that EPA may review response action(s) for OUs that allow hazardous substances to remain on-site, no less often than every five (5) years after the initiation of the final response action for such OU to assure that human health and the environment are being protected by the response action being implemented." The RD/RA Guidance, (DOE-ID 1994) states: "The five-year review process involves an evaluation as to whether the selected remedy remains 'protective', in light of possible new standards, DOE-ID will evaluate, on a case-by-case basis, significant new requirements to ensure that the selected remedy does in-fact remain protective."

The CERCLA five-year review will be completed five years from the start of the RA, and repeated every five years thereafter. The Monitoring Report/Decision Summary will be completed five years after relocation of the percolation ponds and will document the data, rationale, and justification for decisions concerning contingent remedial actions based on the results of the existing remedial action.

Table 7-1. Summary of primary and secondary deliverables and enforceable milestones.

Deliverable	Document Type	Enforceable Milestone	Target Date
Draft Monitoring Well and Tracer Summary Report	Secondary	NA	1/09/02
Draft Phase II Monitoring Summary Report for Year 1	Secondary	NA	10/16/03
Draft Phase II Monitoring Summary Report for Year 2	Secondary	NA	10/26/04
Draft Phase II Monitoring Summary Report for Year 3	Secondary	NA	10/21/05
Draft Phase II Monitoring Summary Report for Year 4	Secondary	NA	10/25/06
Monitoring Report/Decision Summary Report	Primary	6/13/07	—

8. REFERENCES

DOE-ID, 1991, *Federal Facility Agreement and Consent Order,* U.S. Department of Energy Idaho Operations Office, U.S. Environmental Protection Agency Region 10, State of Idaho Department of Health and Welfare.

DOE-ID, 1994, *Remedial Design and Remedial Action Guidance for the Idaho National Engineering Laboratory,* U. S. Department of Energy Idaho Operations Office, DOE/ID-12584-152, Revision 2, September.

DOE-ID, 1997a, *Comprehensive Remedial Investigation/Feasibility Study (RI/FS) for ICPP OU 3-13 Part A; Remedial Investigation/Baseline Risk Assessment Report,* U.S. Department of Energy Idaho Operations Office, DOE/ID-10534.

DOE-ID, 1997b, *Comprehensive Remedial Investigation/Feasibility Study for ICPP OU 3-13 Part B,* U.S. Department of Energy Idaho Operations Office, DOE/ID-10572.

DOE-ID, 1998, *Comprehensive Remedial Investigation/Feasibility Study (RI/FS) for ICPP Operable Unit (OU) 3-13 at INEEL-Part B Feasibility Study (FS) Supplement Report,* U.S. Department of Energy Idaho Operations Office, DOE/ID-10619.

DOE-ID 1999, *Final Record of Decision (ROD) Idaho Nuclear Technology and Engineering Center (INTEC) Operable Unit (OU) 3-13,* U.S. Department of Energy Idaho Operations Office, DOE/ID-10660.

DOE-ID, 2000, *Remedial Design/Remedial; Action Scope of Work for Waste Area Group 3, Operable Unit 3-13,* U. S. Department of Energy Idaho Operations Office, DOE/ID-10721, Revision I, February.

EPA, 1986, *Superfund Remedial Design and Remedial Action Guidance,* U. S. Environmental Protection Agency Office of Emergency and Remedial Response, OWSER, Directive 9355.0-4A, June.

EPA, 1993, *Guidance for Scoping the Remedial Design* (Draft), U. S. Environmental Protection Agency Office of Emergency and Remedial Response, EPA/540-F-93-026, May.

EPA, 1993, *Remedial Design and Remedial Action Handbook* (Draft), U. S. Environmental Protection Agency Office of Emergency and Remedial Response, August.

Fromm, J., J. Welhan, M. Curry, and W. Hackett, 1994, Idaho Chemical Processing Plant (ICPP) Injection Well: Operations History and Hydrochemical Inventory of the Waste Stream, Hydrogeology, Waste Disposal, Science, and Politics, Proceedings of the 30th Symposium on Engineering Geology and Geotechnical Engineering.

Magnuson, S.O., 1995, *Inverse Modelings for Field-Scale Hydrologic and Transport Parameters of Fractured Basalt,* INEL-95-0637, LMITCO, Idaho Falls, ID.

McCarthy, J.M., R.C. Arnett, R.M. Neupauer, M.J. Rohe, and C. Smith, 1995, *Development of a Regional Groundwater Flow Model for the Area of the Idaho National Engineering Laboratory, Eastern Snake River Plain Aquifer,* EGG-ER-11490, Revision 1, March.

Robertson, J.B., R. Schoen, and J.T. Barraclough, 1974, The influence of liquid waste disposal on the geochemistry of water at the National Reactor Testing Station, Idaho, 1952-1970: U.S. Geological Survey Open-File Report IDO-22053, 231 p.

Appendix A

Quality Level Designation

414.02
11/10/98
Rev. 02

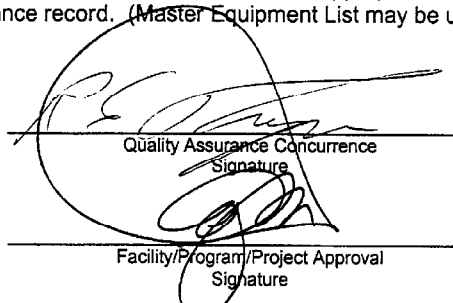
QUALITY LEVEL DESIGNATION AND RECORD

lity Level Evaluation Performed By: R. G. Thompson Date: 4/25/00

Facility/Structure/System: OU 3-13, PERCHED WATER WELL DRILLING Quality Level: 3

IDENTIFICATION OF ITEM	QUALITY LEVEL DESIGNATION	TECHNICAL JUSTIFICATION
Well Drilling & Completion	3	INEEL/INT-2000-00036
Tracer Study	3	INEEL/INT-2000-00036
Well Sampling & Analysis	3	INEEL/INT-2000-00036

Note: Assign and record quality level in accordance with MCP-540, and obtain appropriate approvals. Completed and approved form becomes a quality assurance record. (Master Equipment List may be used as a Q-List.)

R. G. Thompson Quality Assurance Concurrence Printed/Typed Name	 Quality Assurance Concurrence Signature	4/25/2000 Date
C. J. ROBERTS Facility/Program/Project Approval Printed/Typed Name	Facility/Program/Project Approval Signature	4.26.00 Date

ENGINEERING DESIGN FILE

1. Project File No. _____ 2. Project/Task OU 3-13 POST-ROD GROUP 4 PERCHED WATER MONITORING WELLS

3. Subtask Hazard Classification

4. Title: INTEC Group 4 Perched Water Monitoring Well Drilling Hazard Classification

5. Summary: The purpose of this Engineering Design File is to document the hazard classification of the INTEC Group 4 perched water monitoring well drilling project and to support the determination that the project can be safely conducted under the auspices of a Health and Safety Plan.

6. Distribution (complete package): Eric Neher, Carlton Roberts

Distribution (summary package only):

7. Review (R) and Approval (A) Signatures:

	R/A	Printed Name	Signature	Date
Author		Tharan L. Cook	Tharan L. Cook	1/19/00
Independent Verification	R	Rodney Peatross	Rod Peatross	1/19/00
Requestor	A	Carlton Roberts		1/19/00

431.12
08/24/98
Rev. 01

REQUEST FOR DETERMINATION OF SAFETY ANALYSIS REQUIREMENTS

Date: January 19, 2000

A. To Be Completed by Project Manager, Project Management Department

1. Project OU 3-13 Post-Rod Group 4 Perched Water Monitoring Wells

Project Manager Robert E. James Mail Stop 3953

Type: ☐ Line Item ☐ GPP ☐ CE ☐ Work Order ☒ Other ER Project

2. Reference Documents Submitted:

Check the documents submitted with this request:

- ☐ Technical Functional Requirements
- ☐ Design Criteria
- ☐ Conceptual Design Report
- ☐ Environmental Evaluation or EIS
- ☐ USQ Screening
- ☐ Feasibility Studies
- ☐ Project Plan
- ☐ Work Order
- ☐ Engineering Change Form
- ☒ Other ER Project

B. To Be Completed by the Cognizant Safety Analysis Organization

Task Number

1. New Facility Project:

PSAR required before facility construction?	☐ Yes	☒ No
New SAR or revision/addendum to an existing SAR required before operation?	☐ Yes	☒ No
Will this be a nuclear facility (see MCP-2446)?	☐ Yes	☒ No

2. Existing Facility Modifications:

USQ evaluation required?	☐ Yes	☒ No
Revision/addendum to an existing SAR required?	☐ Yes	☒ No
Descriptive changes to an existing SAR required?	☐ Yes	☒ No

Hazard category/classification "Not Requiring Additional Safety Analysis"

3. Justification for Items B.1 - B.2:

See attached hazard classification. This project will be installing monitoring wells around INTEC. Safety analysis is not required based upon the hazard categorization

4. Proposed schedule for Company and DOE approvals of required Safety Analysis:

N/A

Request for Safety Analysis Approval

E. E. Hochhalter	E. E. Hochhalter	1/20/00
Manager, Safety Analysis Unit/Department Print/Type Name	Manager, Safety Analysis Unit/Department Signature	Date

Distribution: Copy for Project Manager; original and one copy to Safety Analysis. Original back to Project Manager when Safety Analysis determination is completed.

OU 3-13, GROUP 4, PERCHED WATER MONITORING WELLS HAZARD CLASSIFICATION

SUMMARY

The purpose of this hazard classification is to present an evaluation of the potential hazards associated with proposed Operable Unit (OU) 3-13 Group 4 perched water monitoring well drilling activities that could affect the public, the workers, or the environment. This evaluation is based on preliminary project information, the OU 3-13 Record of Decision (ROD), and data collected through previous sampling activities.

HAZARD CLASSIFICATION

Based on the guidance presented in DOE-STD-1027-92, Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports, DOE-ID N 420.A1, Safety Basis Review and Approval Process, and DOE-EM-STD-5502-94, Hazard Baseline Documentation, the OU 3-13 Group 4 perched water monitoring well construction activities are classified as "Not Requiring Additional Safety Analysis." No appreciable hazardous waste or hazardous chemical quantities have been identified in this hazard classification, nevertheless the project will be conducted under the administrative control of a Health and Safety Plan to ensure compliance with applicable occupational safety and health standards.

INTRODUCTION

This project consists of drilling eleven sets of new perched groundwater monitoring wells at the Idaho Nuclear Technology and Engineering Center (INTEC) for a total of 33 new wells. Similar activities, and other INTEC remedial actions, have been identified in the INTEC Record of Decision (Ref. 1) and were divided into seven groups in that document. This evaluation addresses constructing new groundwater monitoring wells planned for Group 4, Perched Water.

DESCRIPTION

OU 3-13, Group 4, Perched Water

Perched water can occur at depths ranging from 40 to 420 ft in alluvium and sedimentary interbeds, and basalt, beneath the INTEC. The perched water has been contaminated by leaching and downward transport of contaminants, primarily Sr-90 and tritium from the overlaying surface soils. Contaminants were also introduced during two instances when the INTEC injection well (CPP-23) collapsed and service wastewater was released to the perched zones. The objective of this effort is to monitor soil moisture and drainage of the perched water and to calculate the contaminant flux to the Snake River Plain Aquifer beneath the INTEC after the existing percolation ponds have been removed from service.

This project consists of drilling seven sets of new perched water monitoring wells, completing the initial sampling of the wells, and monitoring the soil moisture and perched water contaminant concentrations for the following twenty years. Current planning indicates that five of the new wells will be drilled to a depth of approximately 45 ft, eleven will be drilled to a depth of 120 to140 ft, eleven will be drilled to a depth of approximately 380 to 420 ft, and six will be drilled to a depth of 450 to 460 ft. The proposed locations of these new wells are provided on Attachment 1.

HAZARDOUS MATERIAL INVENTORY

Perched Water Contaminants

Department of Energy (DOE) Order 5480.23, *Nuclear Safety Analysis Reports*, requires that radioactive and chemical materials be inventoried by type and amount. Those quantities of material are then to be evaluated using the guidance presented in DOE-STD-1027-92 and DOE-EM-STD-5502-94 to establish facility or project hazard categorization. In this case, due to the extremely low quantities of material expected to be encountered during well drilling activities, the inventory of contaminants has been taken from groundwater sampling results that are presented in the Remedial Investigation/Feasibility Study (Ref. 10). The values selected are provided in Table 1.

No distinction has been made between samples taken from northern, southern, shallow, or deep perched water zones; rather, the highest concentrations of the contaminants identified in 2.1, above, are listed. Other contaminants are also listed in the table where the sample results indicated high concentrations, i.e., those identified as exceeding a federal primary or secondary maximum contaminant level.

Table 1. Perched Water Sample Results.

	Perched Water	
Contaminant	Concentration	TQ/RQ[a]
Sr-90	320,000 pCi/L	1.6E+01 Ci/ 1.0E-01 Ci
tritium	73,000 pCi/L	1.0E+03 Ci/ 1.0 Ci
Tc-99	736 pCi/L	1.7E+03 Ci/ 10 Ci
nitrate	35.4 mg/L	NA[b]
chloride	250 mg/L	NA
manganese	165 µg/L	1 lb
iron	324 µg/L	NA

a. TQ = Threshold Quantity, DOE-STD-1027-92
RQ = Reportable Quantity, 40 CFR 302

b. Not listed in 40 CFR 302, Table 302.4

Evaluation

From Table 1, a comparison of the contaminant concentrations to the Threshold and/or Reportable Quantity values shows that many orders of magnitude exist between the levels of radioactive and chemical contaminants expected to be encountered during these well drilling projects and the classification thresholds. There are no radiological hazards associated with this project, due to the extremely low quantities of contaminants and the fact that no mechanism exists to concentrate those contaminants during drilling activities; likewise, there are no hazards from chemical contaminants. The releasable quantities of contaminants would be so small as to be negligible and would result in no threat to the workers, the environment, or the public. However, prior to drilling at any new well set site, data from the nearest wells will be evaluated for activity levels.

Further, Attachment 2 presents an overlay of the proposed locations of the Group 4, perched water monitoring wells and the existing Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites at the INTEC. As can be seen on the drawing, there are no conflicts between proposed well locations and the sites; therefore, none of the wells will be drilled into potential underground hazards and no further analysis is necessary. As an added precaution, each well site will be surveyed and a subsurface investigation performed as part of the drilling preparation activities.

General Project Hazards

Table 2 lists the potential general hazards associated with the OU 3-13 Group 4 perched water monitoring well drilling project activities. This list cites common and project-specific hazards, assesses their applicability to the project, identifies the appropriate occupational health and safety standards, and assesses each hazard as being routine or significant. Any hazards determined to be significant are analyzed further while routine hazards will be addressed in a project Health and Safety Plan.

CONCLUSIONS

Hazard Classification

Based on the information presented above, the hazard classification of the OU 3-13 Group 4 perched water monitoring well drilling project is determined to be "Not Requiring Additional Safety Analysis." No releasable quantities of hazardous or radioactive materials have been identified, hence this project will not present significant, nonroutine concerns to workers, the public, or the environment. There are no general project hazards that have been identified as "Significant," therefore, no further analysis is required. Those general project hazards that have been identified as "Routine" will be addressed and administratively controlled through a project Health and Safety Plan.

Table 2. Potential General Project Hazards.

Hazard	Applicable	OSHA/DOE Standard	Routine/Significant
High Voltage (>600 V)	Yes	29 CFR 1910.308(a), .304(f)(7), .303(h)(2), .303(h)(3), .303(h)(4)	Routine
Flammable gases, liquids, or dust	Yes	29 CFR 1910.106, .120, .144, .1200; 29 CFR 1926.152	Routine
Compressed gases	Yes	29 CFR 1910	Routine
Explosive materials	No	NA	NA
Cryogens	No	NA	NA
Inert and low-oxygen atmospheres (confined spaces)	No	NA	NA
Chemical exposures	No	NA	NA
Nonionizing radiation	No	NA	NA
High-intensity magnetic fields	No	NA	NA
High noise levels	Yes	29 CFR 1910.95, .1200; 29 CFR 1926.52	Routine
Mechanical and moving equipment	Yes	29 CFR 1910.147, .211; 29 CFR 1926, Subpart W	Routine
Working at heights	Yes	29 CFR 1910.25, .28; 29 CFR 1926.951, .451	Routine
Excavation	No	NA	NA
Material handling	Yes	29 CFR 1910.120, .176,. 178, .184; DOE-STD-1090-96, "Hoisting and Rigging"	Routine
Aircraft collision	No	NA	NA
Pesticide use	No	NA	NA
High temperature (>125 °F on contact or >202 °F) and pressure (>25 psig for gas or vapor, or >200 psig for a liquid system)	Yes	29 CFR 1910.120, .1200	Routine
Inadequate illumination	No	NA	NA
Radiological hazardous materials	No	NA	NA
Nuclear criticality	No	NA	NA
Direct radiation	No	NA	NA
Construction	Yes	29 CFR 1926	Routine
Pyrophoric metals	No	NA	NA
Natural phenomena - floods, volcanic activity, earthquakes, etc.	No	NA	NA

OSHA–Occupational Safety and Health Administration

CFR–Code of Federal Regulations

REFERENCES

1. Idaho National Engineering and Environmental Laboratory, *Record of Decision, Idaho Nuclear Technology and Engineering Center,* Operable Unit 3-13, DOE/ID-10660, Revision 00, October 1999.

2. DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports,* Change Notice No. 1, U.S. Department of Energy, September 1997.

3. DOE-EM-STD-5502-94, *Hazard Baseline Documentation,* U.S. Department of Energy, August 1994.

4. DOE-ID N 420.A1, *Safety Basis Review and Approval Process*, U.S. Department of Energy, Idaho Operations Office, May 1998.

5. MCP - 226, *Well Construction/Well Abandonment*, current revision.

6. MCP - 461, *Well Construction and Permitting*, current revision.

7. MCP - 2446, *Controlling the LMITCO Nuclear Facilities and Nuclear Facilities Manager Lists,* current revision.

8. MCP-2451, *Safety Analysis for Other Than Nuclear Facilities*, current revision.

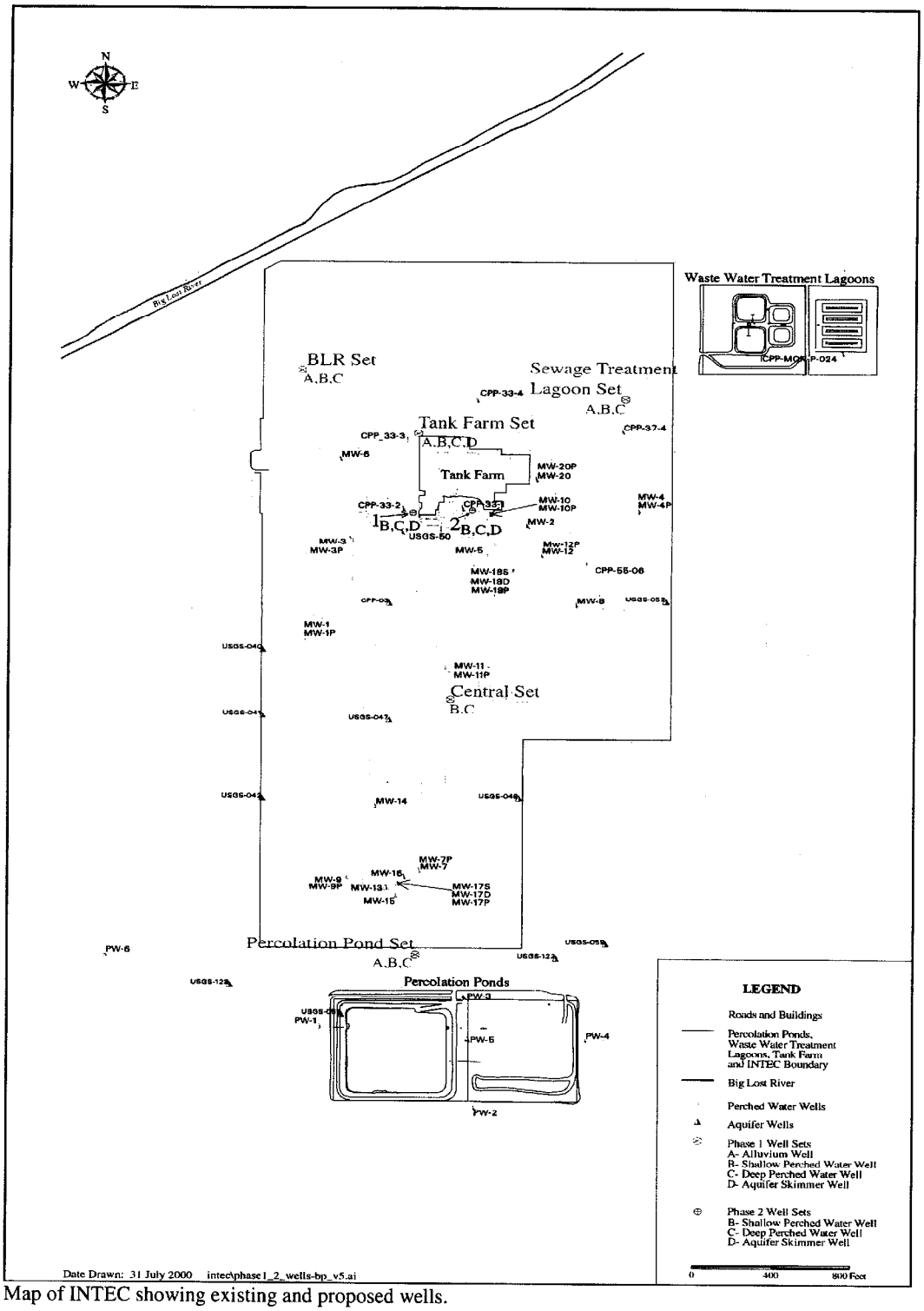
9. Burgess, D., *Health and Safety Plan for the Installation of Groundwater and Soil Vapor Monitoring Wells Between the RWMC and CFA,* INEEL/EXT-98-00150, Revision 0, (Chapter 8), Idaho National Engineering and Environmental Laboratory Department, Lockheed Martin Idaho Technologies Company, Idaho Falls, ID, April 1998.

10. Rodriguez, R.R., et al., *Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 the INEEL - Part A, RI/BRA Report (Final),* DOE/ID-10534, U.S. Department of Energy, Idaho Operations Office, November 1997.

11. Code of Federal Regulations, Title 40, Protection of the Environment, Part 302, Designation, Reportable Quantities, and Notification.

ATTACHMENT 1

OU 3-13, Group 4, Perched Groundwater Proposed Well Locations



Map of INTEC showing existing and proposed wells.

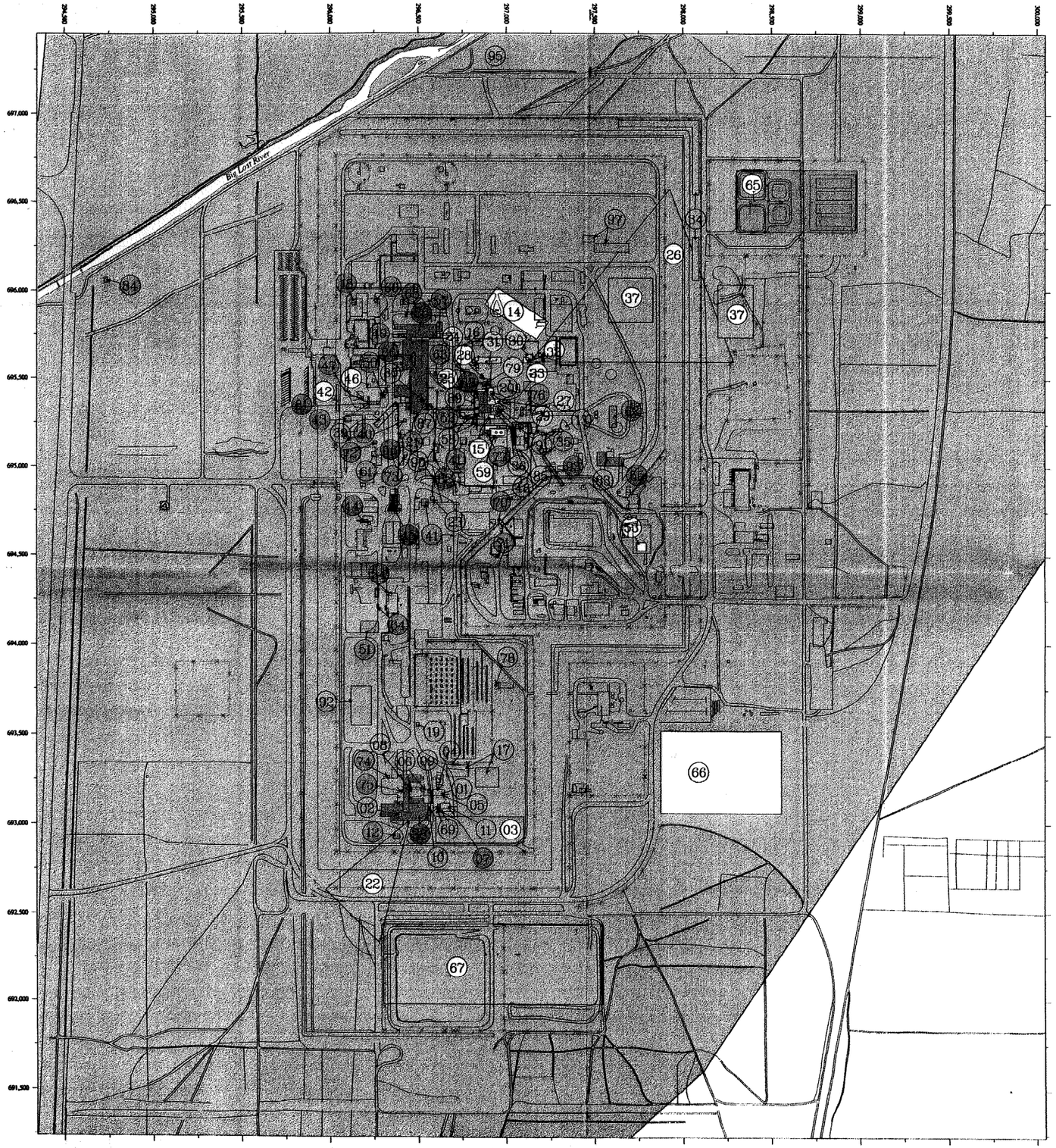
ATTACHMENT 2

OU 3-13, Group 4, Perched Groundwater Proposed Well Locations/CERCLA Sites Overlay

INTEC

Idaho Chemical Processing Plant

CERCLA Sites 1999

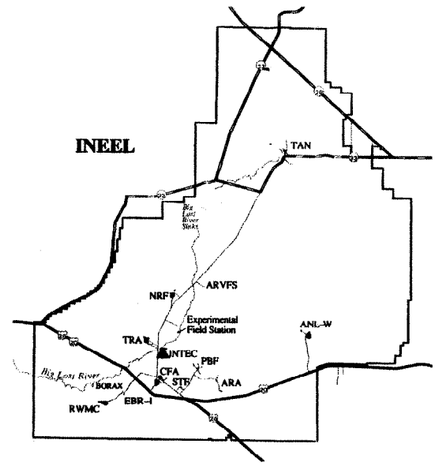


Legend

- Roads and Buildings
- Fences
- Rad.
- UNKNOWN
- Metals and Rad.
- No Known Hazardous Materials
- Metals, Organics, and Rad.
- PCBs
- Metals
- Organics and Rad.
- Metals and Organics
- Construction Debris and Other
- Fuel Oil
- Acids
- No Action

CERCLA Site Key

Operable Unit	Site Code	Action	Description
3-09	CPP-01/04/05		Concrete Settling Basin, Settling Tank, Settling Basin
3-09	CPP-02	Track 2	French Drain
3-09	CPP-03	Track 2	Temporary Storage Area
3-09	CPP-06	Track 2	Trench
3-02	CPP-07	Track 1	Soil Contamination
3-09	CPP-08	Track 2	Basin Filter System Line
3-09	CPP-09	Track 2	Soil Contamination
3-09	CPP-10	Track 2	Plastic Pipeline Break
3-09	CPP-11	Track 2	Sludge and Water Release
3-02	CPP-12	Track 1	Paint Chips and Pad S
3-08	CPP-13	Track 2 to RI/FS	Solid Storage Cyclone
3-05	CPP-14	Track 2 to RI/FS	Sewage Treatment Plant
3-08	CPP-15	Track 2	Solvent Burner
3-07	CPP-16	Track 2	Contaminated Soil
3-09	CPP-17	Track 2	Soil Storage Area
3-02	CPP-18	Track 1	Gas Storage Building
3-09	CPP-19	Track 2	Line Leak
3-07	CPP-20	Track 2	Waste Unloading Area
3-02	CPP-21	Track 1	Solid Waste Storage Bin
3-09	CPP-22	Track 2	Particulate Air Release
3-02	CPP-23	Track 1	CPP Injection Well
3-07	CPP-24	Track 2	Tank Farm Area Soil
3-07	CPP-25	Track 2	Tank Farm Area Soil
3-07	CPP-26	Track 2	Tank Farm Area Soil
3-08	CPP-27	Track 2	Tank Farm Area Soil
3-07	CPP-28	Track 2	Tank Farm Area Soil
3-08	CPP-29	Track 2	Main Stack Area Soil
3-07	CPP-30	Track 2	Tank Farm Area Soil
3-07	CPP-31	Track 2	Tank Farm Area Soil
3-07	CPP-32	Track 2	Tank Farm Area Soil
3-06	CPP-33	Track 1	Tank Farm Area Soil
3-06	CPP-34	Track 1	Soil Storage Area
3-08	CPP-35	Track 2	Decontamination Spill
3-08	CPP-36	Track 2	Transfer line leak
3-02	CPP-37a	Track 1	CPP Gravel Pit #1
3-02	CPP-37b	Track 1	CPP Gravel Pits #1 & #2
3-04	CPP-38	Track 1	Friable Transite
3-13	CPP-39	RI/FS	Storage Tank and Dry Well
3-06	CPP-40	Track 1	Lime Pit and French Drain
3-02	CPP-41	Track 1	Fire Training Pit
3-10	CPP-42	Track 2	Drainage Ditch
–	CPP-43	NFA	Grease Pit (Removed)
3-10	CPP-44	Track 2	Grease Pit
3-11	CPP-45	Track 2	Chemical Storage Area
3-10	CPP-46	Track 2	Courtyard Pilot Plant
3-06	CPP-47	Track 1	Pilot Plant Storage Area
3-13	CPP-48	RI/FS	French Drain
3-01	CPP-49	Track 1	PCB Transformer Yard
3-01	CPP-50	Track 1	PCB Transformer Yard
3-01	CPP-51	Track 2	PCB Staging Area
–	CPP-52	NFA	Pickling Shed (Removed)
3-02	CPP-53	Track 1	Paint and Paint Solvent Area
3-02	CPP-54	Track 1	Drum Storage Area
3-02	CPP-55	Track 1	Mercury Contamination
3-10	CPP-56	Track 2	Nitric Acid Contamination
3-02	CPP-57	Track 1	Sulfuric Acid Spills
3-11	CPP-58	Track 2	PEW Evaporator Pipeline
3-02	CPP-59	Track 1	Kerosene Tank Overflow
3-01	CPP-60	Track 1	Paint Shop
3-02	CPP-61	Track 1	PCB Spill
3-02	CPP-62	Track 1	Mercury Contamination
3-02	CPP-63	Track 1	Hexone Spill
3-02	CPP-64	Track 1	Hexone Spill
3-02	CPP-65	Track 1	Sewage Treatment Plant Lagoons
3-03	CPP-66	Track 1	CPP/CPP Fly Ash Pit
3-03	CPP-67	Track 1	Percolation Ponds #1 and #2
3-09	CPP-68	Track 2	Gasoline Tank (Abandoned)
3-09	CPP-69		Rad. Waste Storage
–	CPP-70	NFA	Septic Tank
–	CPP-71	NFA	Seepage Pits
–	CPP-72	NFA	CPP-758 Cesspool
–	CPP-73	NFA	Leaching Cesspool
–	CPP-74	NFA	Seepage Pit and Septic Tank
–	CPP-75	NFA	Septic Tank
3-06	CPP-76	NFA	Septic Tank and Cesspool
–	CPP-77	Track 2	Seepage Pit and Cesspool
3-09	CPP-78	Track 2	Dry Pool Storage Area Soil
3-07	CPP-79	Track 1	Tank Farm Release
3-12	CPP-80	Track 1	Vent Tunnel Drain
3-12	CPP-81	Track 1	VOG Line (Abandoned)
3-12	CPP-82	Track 2	Abandoned Line
3-07	CPP-83		Perched Water Well
–	CPP-84		Buried Gas Cylinder
3-13	CPP-85	RI/FS	CPP-633 Soil/Reagent Investigation
3-13	CPP-86	RI/FS	CPP-602 Waste Trench Sump
3-13	CPP-87	RI/FS	CPP-604 VOG Blower Core
3-13	CPP-89	RI/FS	CPP-604/04 Tunnel Excavation
3-13	CPP-90	RI/FS	CPP-709 Radiolysis Detection
3-13	CPP-91	RI/FS	WCF Blower Pit
3-13	CPP-92	RI/FS	Radioactive Contaminated Soil Bones
3-13	CPP-93	RI/FS	Simulated (Nonrad) Calcine Trench
3-13	CPP-94		Buried Gas Cylinder
3-13	CPP-95		Airborn Plume
–	CPP-97		Tank Farm Stockpiles



Vicinity Map

0 200 400 600 800 1000 Feet

Date Drawn: January 27, 2000

INEEL SPATIAL ANALYSIS LABORATORY

APPLYING TECHNOLOGY TO MEET ENVIRONMENTAL NEEDS